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PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Improvements relating to Sliding Clasp Fasteners

5 We, CUE FASTENER INC., a Corporation organised under the Laws of the State of New York, United States of America, of 748, Madison Avenue, New York, State of New York, United States of America, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 This invention relates to sliding clasp fasteners and, in particular, to improved stops for the sliders of such fasteners and to methods of making and fixing such stops to the lines of fastening elements.

15 The term "stops" used herein refers to elements which are applied to the fastening elements or their components of slide fasteners to keep the slider used for joining and disconnecting the fastening elements from running off the ends of the lines of fastening elements.

20 There are many different types of stops in use, each of which serves a specific purpose. Closed bottom stops serve to hold and position the two sides of the fastener together at one end as well as to restrict the movement of the slider beyond a predetermined point on the fastener.

25 Open top stops enable the sides of the slide fastener above the slider to remain apart but prevent the slider from running off the ends of the fasteners.

30 The third general type of stop is the bridge top stop which is found mainly on slide fasteners used for dress plackets and the like. The bridge top stops preposition the fastener at its upper portion and prevent it from being opened completely.

35 Usually, the various types of stops referred to above are small metallic clips which are folded around the lines of fastening elements or parts thereof and clinched through the supporting tape or fabric to provide an abutment against which the slider of the fastener will engage to keep it from running off the end of the fastener. One form of these stops

resembles a staple having a flattened mid-portion and angularly related points which are forced through the fabric at the adjacent ends of the two rows of fasteners and clinched on the opposite side of the fabric to hold the fastener elements together in proper alignment.

50 The open top stops may be similar U-shaped elements which are clinched around the beaded edge and tape in order to form abutments and thus prevent the slider from running off the fastener elements.

55 The bridge top stop may be similar to the bottom stop and may be attached in the same general way. All of these stops have certain disadvantages from a manufacturing as well as from a consumer standpoint.

60 The fold-over or staple types of stops have to be preformed by stamping or other suitable means and then attached to the stringer in a separate operation.

65 It has also been proposed to make bottom stops of strips of plastic material which are pressed against interlocked fastener elements and fused so that the elements are locked together in the path of the slider.

70 According to the present invention, the fastener comprises two lines of fastening elements each line comprising a strip of plastic formed into a series of loops fixed to a fabric strip, and a stop made of plastic material moulded round a number of the loops at or adjacent one end of at least one of the plastic strips, the stop being united with the fabric strip between the loops around which it is moulded.

75 The stops may be formed of any suitable thermoplastic resin or other plastic, for example, "Nylon," or that known by the registered trade mark "Vinylite," which are used or have been used heretofore in the formation of slide fasteners of the plastic type.

80 Since the stops are moulded or cast on the fastening elements, the rows of fasteners can be manufactured continuously in a mass production operation and the stops thereafter applied as may be required to different

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lengths of the fastener material to produce slide fasteners of the desired sizes and characteristics. A particular advantage of the present type of stop is that it is formed of a relatively soft material so that when the slide fastener is being attached to a garment, contact of the needle with the stop will not necessarily break the needle as is usually the case when the needle strikes a metallic stop on a conventional fastener.

The new type of stop can be blended in with the remainder of the fastener so that it is inconspicuous while, nevertheless, being effective for the purpose for which it is designed.

The lines of fastening elements and the stops can also be provided with moulded portions which produce the effect of boning the slide fastener to give it stiffness where desired in order to stiffen garments or the like in which the fasteners are used. Moreover, the stops may be shaped and positioned to protect the fastening elements at either end of the stringer and prevent them from coming into contact with the wearer or the wearer's garments.

Several examples of fasteners with stops according to the invention are illustrated in the accompanying drawings in which:—

Fig. 1 is a plan view of a portion of a helical slide fastener having a closed bottom stop;

Fig. 2 is a plan view of a helical slide fastener having a bridge type stop;

Fig. 3 is a plan view of a portion of a helical slide fastener having a pair of open top stops.

Fig. 4 is a perspective view of an open mould by means of which the stops can be moulded on slide fasteners; and

Fig. 5 is a view in cross section through the closed mould.

The present invention will be described with reference to the moulding of stops of various types on a coil of the fastener in which the interengaging fastening elements are formed as continuous coils of a plastic material each turn of the coil forming one element.

In the fasteners shown in Figures 1 to 3, each line of fastener elements includes a flattened helical coil 10 of a filament of oblong cross section which is secured to a tape 11 with provision for a bead 12 for guiding the slider for the fastener, as may be required.

As shown in Fig. 1, two of the lines of fastening elements 14 and 15 making up a slide fastener, are joined at their bottom ends by means of a closed bottom stop 17. The closed bottom stop 17 consists of a slug of thermo plastic resin such as "Nylon" which has been moulded into and around the turns at the ends of the coil and bonded thereto by cooling the molten resin. The molten resin is injected under pressure so that it penetrates into the tapes 11 and the loops of the coils

10 and bonds them together so that they cannot be separated without damaging the tapes 11, 11 and the coils 10, 10.

The manner in which such a bottom stop 17 is moulded on the coils will be more apparent from consideration of the moulding apparatus disclosed in Figs. 4 and 5 of the drawings. The moulding apparatus includes a base plate 20 which is secured to the platen of an injection moulding apparatus. The base plate 20 has an upstanding block 21 thereon. Extending about half-way across the upper surface of the block 21 are a pair of grooves 22 and 23 adapted to receive the ends of the coils 10, 10 and the beads 12, 12 of the stringers 14 and 15. Narrower grooves 22a and 23a extend from the inner ends of the grooves 22 and 23 to receive the beads 12, 12 extending along the tapes of the fastener. The tapes 11, 11 lie on the top of the block 21 on opposite sides of the grooves. A mould recess 24 is formed at and joins the inner ends of the grooves 22 and 23 to receive the plastic to be moulded around the ends of the coils 10, 10 as will be explained.

The block 21 is provided with a vertical bore 25 in which is received a plunger 26 having an enlarged head portion 27 fitting in the bore and normally being urged upwardly by means of a spring 28 interposed between the lower end of the plunger and a plug 29 in the base plate 20. The upper end or head 27 of the plunger has an upwardly extending flange 27a in which is provided with an inverted keystone shaped claw 27b; the claw and flange being thin and flat and extending through a slot 30 between the groove portions 22a and 23a.

The mould also includes an upper mould section 31 which is provided with a pair of dowel pins 32 and 33 engageable in holes 34 and 35 in the lower mould section to guide the sections into alignment. The mould section 31 has a recess 36 in its top to receive a plate 37 having a sprue passage 40 therein, through which the plastic material is introduced by means of an injection nozzle 41, as shown in Fig. 5. The sprue passage 40 is flared and extends through an extension member 43 which is slidable in a hole 44 in the bottom of the mould section 31. The plate 37 is normally urged upwardly by means of a pair of coil springs 45 and 46 interposed between the bottom of the recess 36 and the bottom of the plate 37. The undersurface of the mould section 31 is also provided with a mould cavity 48 to mould the top of the bottom stop to the shape desired.

In operation, the two stringers 14 and 15 of the slide fastener are pulled into the grooves 22 and 23 so that the ends of the coils 10, 10 are positioned in the mould recess 24. With the two stringers of the slide fastener in position, the upper mould half 31 is moved downwardly and the injection nozzle

41 is moved to engage the plate 37 and inject a charge of molten plastic through the sprue opening 40 into the mould cavity 24, 48. As the plate 37 moves downwardly, the end of the tubular extension 43 engages the claw 27b and pushes the plunger 26 downwardly so that the plastic can flow into the mould cavity 24, 48 through the end of the slot 30, as shown in Fig. 5. After the plastic is injected into the mould cavity 24, 48, the nozzle 41 is raised and the springs 28, 45 and 46 raise the plate 37 and the plunger 26 upwardly. As a result, the edges of the flange 27a shears off the plastic at the inner edge of the mould recess 24, 48. When the upper mould section 31 is raised to open up the mould, the plastic in the sprue opening 40 will be engaged with the claw 27b and will be pulled out of the opening 40 and can be discharged from the claw 27b by an air blast or sweeper (not shown).

The mould cavity can be modified, of course, to accommodate different sizes of fastener elements and to mould different kinds of stops on the fasteners. For example, a horseshoe-shaped cavity may be provided in the mould so that an arcuate bridge stop 50 can be moulded on the adjacent ends of the coils 51 and 52 of the two cooperating stringers 53 and 54.

Likewise, as shown in Fig. 3, separate open top stops can be formed by moulding smaller slugs 55 and 56 of plastic on the outer ends of the coils 57 and 58 to retain the slider thereon.

The slugs have about the same cross-sectional dimensions as the convolutions or loops of the coils 57 and 58 and fill in between the loops to form the solid stops. The plastic penetrates the tapes 60 and 61 on which the coils are fastened further strengthening the stops and holding them securely in position. If desired, the mould may be so arranged that the plastic is cast around and penetrates the beads as well as the tapes or fabric on which the fastener elements are mounted. By appropriately selecting the type of plastic material used for the formation of the stops, it is possible to form a purely mechanical bond between the stops and the slider elements. By selecting materials of suitable properties and using appropriate temperatures for melting the plastic material, it is possible to weld the stops to rows of plastic fastener elements.

The plastic or resin may be used with metal fasteners where only a mechanical bond is formed therebetween. However, the bond between the fasteners and the stops and the stop and the fabric is so strong that the stop can be displaced only by damaging the fastening elements. The stops do not neces-

sarily have to encompass the fastening elements. They can be cast between the elements or outwardly of the endmost fastening elements. The stops can, of course, be modified to include functional or ornamental features such as decorative additions or buttons, hooks and the like for cooperation with button holes, eyes and the like on the same or different garment or article.

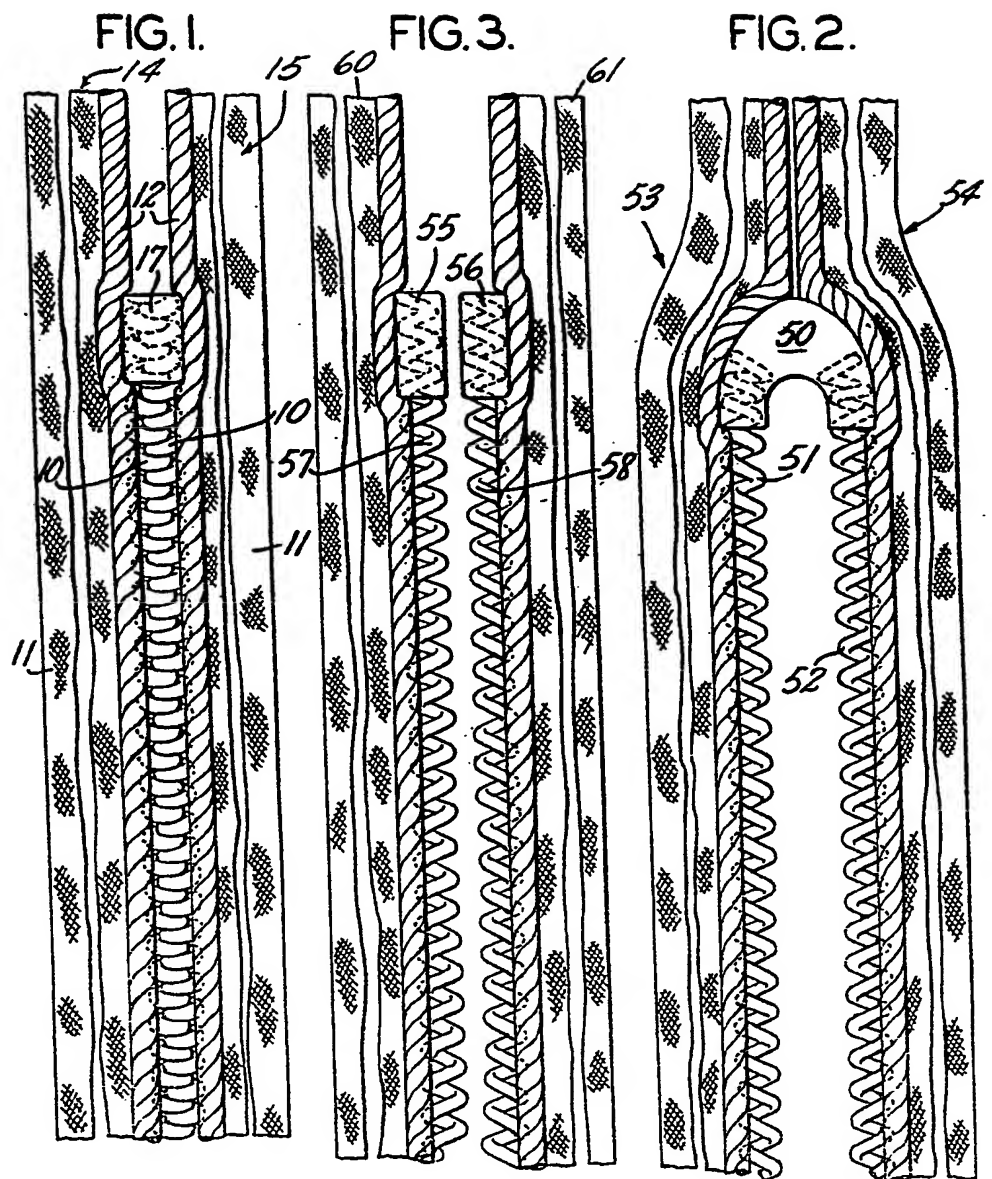
The use of stops formed of plastic with fasteners formed of plastic is most advantageous particularly when producing coloured fasteners. The moulding machine can be charged with the same kind of plastic as that from which the fastener elements are formed so that the stops will exactly match the fastener elements when applied thereto. Moreover, a homogeneous stop is produced which cannot be dislodged and because of its relation to the fastener elements, in many cases, it will prevent misalignment of the fastener elements and thereby facilitate the closing of the fastener.

What we claim is:—

1. A sliding clasp fastener comprising two lines of fastening elements each line comprising a strip of plastic formed into a series of loops fixed to a fabric strip, and a stop made of plastic material moulded around a number of the loops at or adjacent one end of at least one of the plastic strips, the stop being united with the fabric strip between the loops around which it is moulded.
2. A sliding clasp fastener according to claim 1, in which both the lines of fastening elements are connected together by a single stop.
3. A sliding clasp fastener according to claim 1 or claim 2, having a guide bead fixed along each fabric strip adjacent the line of fastening elements, the stop being moulded around opposite sides of the strip and in contact with the bead.
4. A sliding clasp fastener according to claim 2, in which the stop is bridge-shaped so that the two strips of fabric are kept apart adjacent the stop.
5. A sliding clasp fastener according to claim 1, constructed and arranged substantially as described with reference to Figures 1, 2 or 3 of the accompanying drawings.
6. A method of moulding a plastic stop on a sliding clasp fastener as claimed in claim 1, substantially as described with reference to Figures 4 and 5 of the accompanying drawings.

For the Applicants.

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COMPLETE SPECIFICATION

2 SHEETS

This drawing is a reproduction of
the Original on a reduced scale.

SHEETS 1 & 2

